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Psilachnum staphyleae, a new member of foliicolous *Hyaloscyphaceae* from Korea

Jae-Gu Han, Mi-Jeong Park & Hyeon-Dong Shin*

hanjaegu@korea.ac.kr mijpark@korea.ac.kr & hdshin@korea.ac.kr
Division of Environmental Science and Ecological Engineering,
College of Life Sciences and Biotechnology, Korea University
Seoul 136-701, Korea

Abstract — An interesting hyaloscyphaceous species was found on fallen leaves of *Staphylea bumalda*. The fungus fit well within the concept of *Psilachnum*. It is distinguished from other members of the genus by the almost sessile apothecia and foliicolous habit. We describe it as a new species, *Psilachnum staphyleae*.

Key words — *Ascomycota, Helotiales,* species nova, taxonomy

Introduction

The genus *Psilachnum* Höhn. is a small group of *Hyaloscyphaceae* that comprise species with minute apothecia possessing cylindric, smooth-walled hairs, cylindric to narrowly lanceolate paraphyses, and ellipsoid to fusoid small ascospores. Since Höhnel (1926) erected this genus approximately 27 species have been recorded worldwide (Dennis 1978, Huhtinen 1987, Sharma 1988, Galan & Raitviir 1999, Zhuang et al. 2002, Raitviir 2004).

In the investigation of Korean discomycetes, an interesting *Psilachnum* species was found on fallen leaves of bumalda bladdernut (*Staphylea bumalda* DC.), a deciduous shrub distributed only in Eastern Asia, China, Korea, and Japan. This vernal fungus belongs to *Psilachnum* but differs from all known species of the genus in the almost sessile apothecia and foliicolous habit.

Materials and methods

Fresh material was primarily mounted in distilled water to observe the natural color of the microstructures. Dried material was revived in 3% aqueous KOH. Amyloid reactions were tested by Melzer's reagent (MLZ) or Lugol's solution

* Author for correspondence

(IKI). Measurements were made in Lacto-Cotton Blue (CB). Line drawings were made with the aid of an Olympus BX50 microscope equipped with a drawing tube. The microscopic photographs were taken by a digital camera (Axiocam MRc5) mounted on a DIC microscope (Zeiss AX10). Specimens studied have been deposited in the Korea University Herbarium, KUS.

To obtain pure cultures, fresh apothecia were attached to the lid of a Petri dish facing down to eject their ascospores onto the 50% diluted PDA media containing streptomycin sulfate (S6501-100G, Sigma-Aldrich). Germinating spores were carefully transferred to the nutrient-rich media such as CMA, MEA, and PDA, using a stereomicroscope (Olympus SZ40). They were incubated for 10 weeks at 25°C under 12 hour-alternative fluorescent light conditions. Cultures were deposited in the Korea Agricultural Culture Collection, KACC.

Description

Psilachnum staphyleae J.G. Han, M.J. Park & H.D. Shin, **sp. nov.** Figures 1–3

MycoBank MB 515080

Apothecia dispersa vel gregaria, breviter stipitata usque ad subsessilia, primo subglobosa, dein cupulata vel applanato-cupulata, 1 mm diametro, disco cremeo vel bubalino, receptaculo cremeo usque ad pallide cinnamomeo, sicca albido vel cremeo, piloso. Excipulum ectale ex textura prismatica compositur, cellulis hyalinis, tenuiter, tunicatis, 9–11.5 × 4.5–8 µm. Pili cylindracei, apicibus angustatis acutis, septati, tenuiter hyalinotunicati, laeves, 20–56 × 2–3.5 µm. Asci non uncinati, cylindraceo-clavati, octospori, 33–46 × 4–5 µm, poro MLZ+. Sporae biseriatae vel oblique uniseriatae, hyalinae, anguste clavato-fusoideae, interdum anguste cylindraceo-fusoideae, rectae vel minute curvatae, aseptatae, biguttulatae, (5.5–)5.7–7.2(–8) × (1–)1.1–1.4(–1.6) µm. Paraphyses lanceolatae, ascos 12–21 µm superantes, 2.5–4 µm in diametro.

In foliis putridis Staphyleae bumaldae *crescit. Species foliicola apotheciis subsessilis distincta.*

Holotype – on damp rotting leaves of *Staphylea bumalda*, Experimental Forest of Kangwon National University, Hongcheon, Korea, 37°44'25"N 127°49'54"E, 10 V 2002, alt. 220 m, H.D. Shin (*KUS-F50507*).

Etymology – the specific epithet 'staphyleae' refers to the host plant.

Apothecia superficial, scattered to gregarious, seated on a very short stipe, appearing nearly sessile. Receptacle at first almost globose, then becoming cupulate to shallow-cupulate, cream-colored to pale cinnamon when fresh, turning whitish to cream colored when dry, externally covered with whitish hairs. Disc up to 1 mm in diameter, pale cream-colored to pale buff when fresh and dry. Stipe very short, about 0.1 mm long, concolorous with the receptacle. Hairs cylindric, apically tapering and pointed, hyaline, septate, thin-walled, fragile, firmly agglutinated to form triangular teeth at the margin of apothecium, externally smooth, 20–56 µm long, 2–3.5 µm wide. Ectal excipulum of textura prismatica, cells hyaline, thin-walled, 9–11.5 × 4.5–8 µm. Asci not

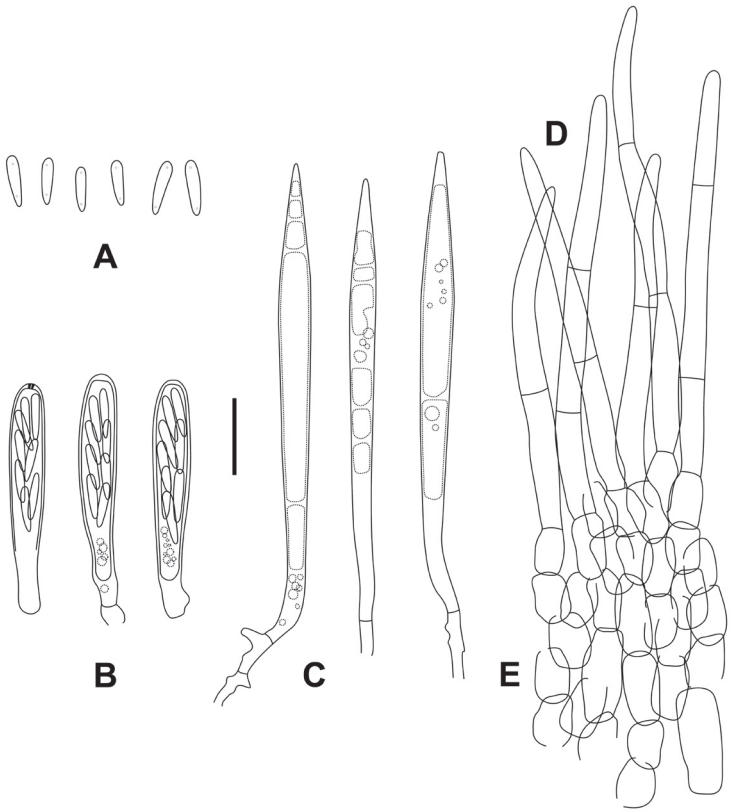

Figure 1. *Psilachnum staphyleae* (holotype *KUS-F50507*).
A: ascospores, B: asci, C: paraphyses, D: hairs, E: ectal excipulum.
Scale bar = 10 μm.

arising from croziers, cylindric-clavate, 8-spored, 33–46 × 4–5 μm, apical pore blued in MLZ and IKI without KOH-pretreatment. Ascospores biseriate to obliquely uniseriate, narrowly clavate-fusoid, sometimes narrowly cylindric-fusoid, straight to slightly curved, hyaline, aseptate, two small polar guttules visible in vital status, (5.5–)5.7–7.2(–8) × (1–)1.1–1.4(–1.6) μm, avg. 6.4 × 1.3 μm (n = 40). Paraphyses lanceolate, tapering to a sharp apex, exceeding the asci by 12–21 μm, 2.5–4 μm wide, uni- to bi-septate near the base.

Additional specimens examined – KOREA: Yangpyeong, Experimental Forest of Korea University, 37°24'49"N 127°45'4"E, alt. 110 m, 27 IV 2008, J.G. Han, M.J. Park and H.D. Shin (*KUS-F52035*); Hongcheon, Bukbang-myeon, Bukbang-ri, 37°42'45"N 127°47'24"E, alt. 260 m, 3 VI 2008, J.G. Han, M.J. Park and H.D. Shin (*KUS-F52105*, *KACC44088*).

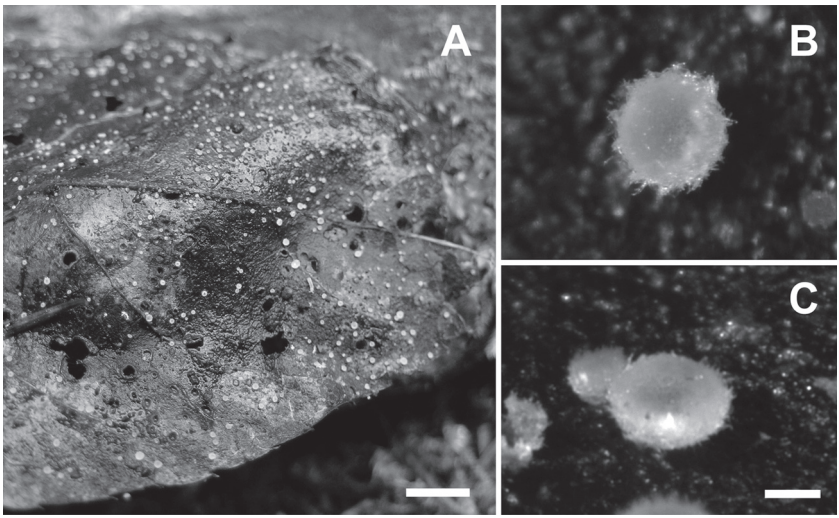

Figure 2. Flesh apothecia of *Psilachnum staphyleae* (*KUS-F52105*) on *Staphylea bumalda* leaves. Scale bars A = 10 mm, B–C = 2 mm.

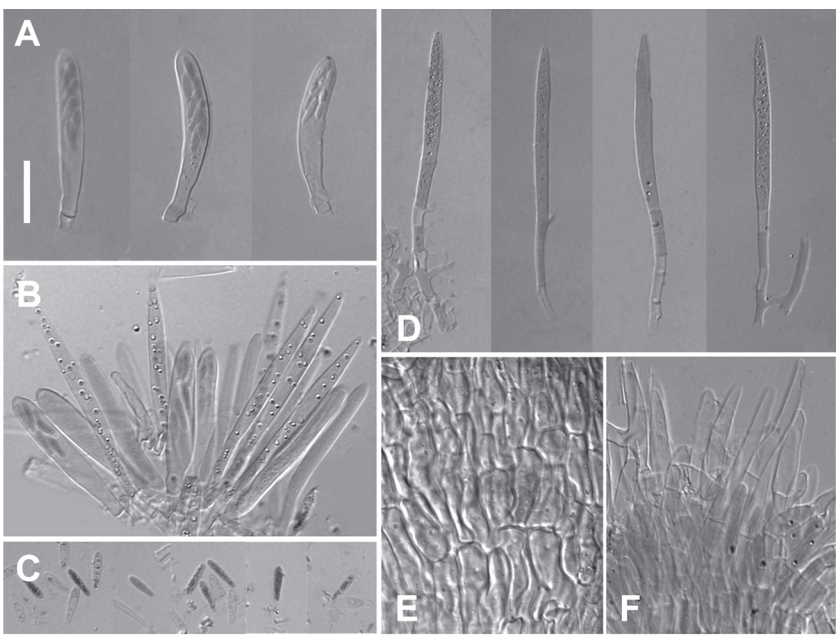

Figure 3. *Psilachnum staphyleae* (holotype *KUS-F50507*). A: asci arising from simple septa, apical pore blued in IKI, B: asci and paraphyses, note the paraphyses exceeding the asci, C: clavate ascospores containing two small guttules, D: lanceolate paraphyses, E: ectal excipulum composed of prismatic cells, F: smooth walled hairs. Scale bar = 10 μm.

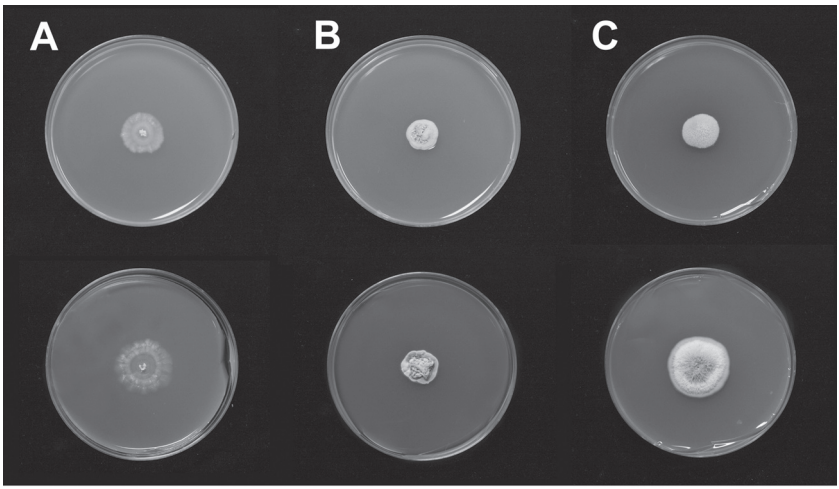

Figure 4. Colonies of *Psilachnum staphyleae* (*KACC44088*) incubated on CMA (A), MEA (B), and PDA (C) at room temperature after 5 weeks (upper line) and 10 weeks (lower line).

Colonies on CMA very slow growing; 18–22 mm in diameter after 5 weeks, 27–29 mm in diameter after 10 weeks; flat, slightly umbonate at the center; margins uneven; aerial hyphae sparsely diffused, felty, white; submerged mycelium glabrous, hyaline to ivory, faintly zonate with concentric bands; reverse concolorous; diffusing pigments absent; no sporulation observed (Fig. 4A).

Colonies on MEA very slow growing; 12–15 mm in diameter after 5 weeks, 17–20 mm in diameter after 10 weeks; slightly convex; margins uneven; aerial hyphae downy, grayish white; submerged mycelium light brown, cerebroid around the center; reverse light grayish brown, becoming dull mustard; pale brown pigment diffusing from the colony margin into the surrounding agar; no sporulation observed (Fig. 4B).

Colonies on PDA very slow growing; 15–17 mm in diameter after 5 weeks, 27–30 mm in diameter after 10 weeks; convex; margins entire; aerial hyphae felty, grayish white, partly yellowish brown; submerged mycelium not visible from above; in reverse brown to chestnut, darkening toward the center, margins ivory; pale brown pigment diffusing from the colony margin into the surrounding agar; no sporulation observed (Fig. 4C).

Results and discussion

Psilachnum is a widely distributed genus of *Hyaloscyphaceae* occurring on various kinds of substrates including monocotyledonous and dicotyledonous

herbaceous stems, fronds, or stems of pteridophytes and wood. The combination of ellipsoid or fusoid ascospores, cylindric to narrowly lanceolate paraphyses and small hairy apothecia is reminiscent of *Lachnum* Retz., but they are distinguished from this genus by their smooth-walled cylindric hairs.

Psilachnum staphyleae is typical of the genus, differing from the known species by the combination of its almost sessile apothecia, asci not arising from croziers, and foliicolous habit (Figs 2–3). Although the fallen leaves of various deciduous trees and grasses were tightly mixed on the ground, the apothecia of this species were only found on *Staphylea bumalda*, which suggests that *P. staphyleae* is substrate-specific to leaves of this plant.

Psilachnum chrysostigmum (Fr.) Raitv. 1970 has ascospores of similar shape and size (6.5–9 × 1.5–2 µm), but differs by its yellowish disc as well as smaller paraphyses which are 2.5–3 µm in width and exceed the asci by only 10 µm (Raitviir 2004). Another comparable species, *P. inquilinum* (P. Karst.) Dennis 1962 is distinguished by the narrower paraphyses, up to 2.5 µm wide (Huhtinen 1987). *P. cassandrae* (Kanouse) Shoemaker et al. 1980 is the only species previously described from a dicotyledonous leaf. However, it is distinguished from *P. staphyleae* by its 1–2 mm long stipe (Raitviir 2004).

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